2010 Annual Drinking Water Quality Report For

Public Water System Name: USAF-Luke
Public Water System Number: AZ04-07-305

We are pleased to present to you this year's water quality report. Our constant goal is to provide you with a safe and dependable supply of drinking water.

General Information About Drinking Water

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV-AIDS or other immune system disorders, some elderly, and infants can be particularly at risk of infections. These people should seek advice about drinking water from their health care providers. For more information about contaminants and potential health effects, or to receive a copy of the U.S. Environmental Protection Agency (EPA) and the U.S. Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and microbiological contaminants call the EPA *Safe Drinking Water Hotline* at 1-800-426-4791.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- ***Microbial contaminants***, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- ***Inorganic contaminants***, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- ***Pesticides and herbicides*** that may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses.
- ***Organic chemical contaminants***, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and also may come from gas stations, urban stormwater runoff, and septic systems.
- ***Radioactive contaminants***, that can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the Arizona Department of Environmental Quality prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration regulations establish limits for contaminants in bottled water.

Our Water Source(s)

Luke Air Force Base's drinking water is groundwater supplied through various wells that pump from the West Salt River Valley sub-basin within the Phoenix Active Management Area defined by the Arizona Department of Water Resources. The water from these on base wells is treated with chlorine as a disinfectant at the well head, mixed within the distribution system, stored in two above ground tanks on base, and distributed throughout the base and base housing. In addition, Luke AFB has one location that provides purified water that has been through an extra filtration process called reverse osmosis. This filtration removes contaminations that may affect taste and other aesthetics. Taps that supply this water are located at the building beneath the water tower near the intersection of Bong Lane and Mitchell Street.

Source Water Assessments on file with the Arizona Department of Environmental Quality are available for public review. If a Source Water Assessment is available, you may obtain a copy of it by contacting the Arizona Source Water Coordinator at (602) 771-4641.

The Source Water Assessment Report provides a screening-level evaluation of potential contamination that **could** occur. It does not mean that the contamination **has or will** occur. We can use this information to evaluate the need to improve our current water treatment capabilities and prepare for future contamination threats. This can help us ensure that quality finished water is delivered to your homes. In addition, the source water assessment results provide a starting point for developing a source water protection plan.

Luke AFB's drinking water is managed by two base agencies. Civil Engineering (56 CES/CEOI) manages the maintenance and operation of the drinking water supply and distribution system. Bioenvionmental Engineering (BE) (56 AMDS/SGPB) monitors the quality of the drinking water provided to consumers and addresses any related health concerns.

Terms and Abbreviations

To help you understand the terms and abbreviations used in this report, we have provided the following definitions:

- ***Parts per million (ppm) or Milligrams per liter (mg/L)*** - one part per million corresponds to one minute in two years or a single penny in $10,000.
- ***Parts per billion (ppb) or Micrograms per liter (µg/L)***- one part per billion corresponds to one minute in 2,000 years, or a single penny in $10,000,000.
- ***Parts per trillion (ppt) or Nanograms per liter (nanograms/L)*** - one part per trillion corresponds to one minute in 2,000,000 years, or a single penny in $10,000,000,000.
- ***Parts per quadrillion (ppq) or Picograms per liter (picograms/L)*** - one part per quadrillion corresponds to one minute in 2,000,000,000 years or one penny in $10,000,000,000,000.
- ***Picocuries per liter (pCi/L)*** - picocuries per liter is a measure of the radioactivity in water.
- ***Nephelometric Turbidity Unit (NTU)*** - nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.
- ***Action Level*** **(AL) -** the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
- ***Action Level Goal (ALG)*** **-** The "Goal" is the level of a contaminant in drinking water below which there is no known or expected risk to health. The ALG allows for a margin of safety.
- ***Treatment Technique (TT)*** **-** A treatment technique is a required process intended to reduce the level of a contaminant in drinking water.
- ***Maximum Contaminant Level Goal*** **(MCLG) -** The "Goal" is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- ***Maximum Contaminant Level*** **(MCL)-** The "Maximum Allowed" is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Residual Disinfectant Level Goal **(MRDLG): The level of a drinking water disinfectant, below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.**

Maximum Residual Disinfectant Level **(MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.**

Running Annual Average (RAA): **An average of monitoring results for the previous 12 calendar months.**

Water Quality Data

We routinely monitor for contaminants in your drinking water according to Federal and State laws. The State of Arizona requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year, or the system is not considered vulnerable to this type of contamination. Some of our data, though representative, may be more than one year old.

These tables show the results of our monitoring for the period of January 1 to December 31, 2010 unless otherwise noted.

Microbiological Contaminants

Contaminant	MCL	MCLG	Unit	Result	Violation (Yes or No)	Sample Date	Likely Source of Contamination
Total Coliform Bacteria for Systems that collects<40 samples per month	No more than 1 positive monthly sample	0	Absent or Present	Absent	No	10/month	Naturally present in the environment
Fecal coliform and E. Coli	A routine sample & a repeat sample are total coliform positive, & one is also fecal coliform or *E. coli positive*	0	Absent or Present	Absent	No	10/month	Human and animal fecal waste

Radionuclides

Contaminant	MCL	MCLG	Units	Level Detected & Range	Violation (Yes or No)	Sample Date	Likely Source of Contamination
Gross Beta emitters	15	0	mrem	3.5	No	Mar 10	Decay of natural and man-made deposits
Alpha emitters	15	0	pCi/l	3.0	No	Mar 10	Erosion of natural deposits
Combined radium	5	0	pCi/l	<0.4	No	Mar 10	Erosion of natural deposits
Uranium	30	0	ppb	2.4	No	Mar 10	Erosion of natural deposits

Lead and Copper

Contaminant	AL	ALG	Units	90th Percentile	Number of Sites over AL	Violation (Yes or No)	Sample Date/Year	Likely Source of Contamination
Copper	1.3	1.3	ppm	0.08	0	No	Sep 10	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead	15	0	ppb	0.02	0	No	Sep 10	Corrosion of household plumbing systems, erosion of natural deposits

Disinfectants

	MRDL	MRDLG	Units	Level Detected & Range	Violation (Yes or No)	Sample Date/Year	Source
Chlorine	4	4	ppm	0.29-1.18	NO	RAA	Water additive used to control microbes

Disinfection Byproducts

Contaminant	MCL	MCLG	Units	Average	Range	Highest RAA	Violation (Yes or No)	Sample Date/Year	Likely Source of Contamination
Haloacetic Acids (HAA)	80	N/A	Mg/L	0.0016	0.12-0.20	N/A	No	Nov 10	By-product of drinking water disinfection
Total Trihalomethanes (TTHM)	60	N/A	Mg/L	0.00720	0.58-0.85	N/A	No	Nov 10	By-product of drinking water disinfection

Inorganic Contaminants

Contaminant	MCL	MCLG	Units	Level Detected/ Range	Violation (Yes or No)	Sample Date	Likely Source of Contamination
Antimony	6	6	ppb	<2	No	Mar 10	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic	50	0	ppb	<1	No	Mar 10	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
Asbestos	7	7	MFL	<0.2	No	Sep 07	Decay of asbestos cement water mains; erosion of natural deposits
Barium	2	2	ppm	<0.13	No	Mar 10	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Beryllium	4	4	ppb	<1	No	Mar 10	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries
Cadmium	5	5	ppb	<1	No	Mar 10	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints
Chromium	100	100	ppb	<1	No	Mar 10	Discharge from steel and pulp mills; erosion of natural deposits
Cyanide	200	200	ppb	<1	No	Mar 10	Discharge from steel/metal factories; discharge from plastic and fertilizer factories
Fluoride	4	4	ppm	<1	No	Mar 10	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Mercury (inorganic)	2	2	ppb	<0.2	No	Mar 10	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland

Contaminant	MCL	MCLG	Units	Level Detected/ Range	Violation (Yes or No)	Sample Date	Likely Source of Contamination
Nitrate (as Nitrogen)	10	10	ppm	7.6	No	Mar 10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (as Nitrogen)	1	1	ppm	<0.2	No	Mar 10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Selenium	50	50	ppb	<0.2	No	Mar 10	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines
Thallium	2	0.5	ppb	<1	No	Mar 10	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories

Synthetic Organic Contaminants, Including Pesticides and Herbicides

Contaminant	MCL	MCLG	Units	Level Detected/ Range	Violation (Yes or No)	Sample Date	Likely Source of Contamination
2,4-D	70	70	ppb	<0.1	No	Nov 10	Runoff from herbicide used on row crops
2,4,5-TP (Silvex)	50	50	ppb	<0.5	No	Nov 10	Residue of banned herbicide
Alachlor	2	0	ppb	<0.2	No	Nov 10	Runoff from herbicide used on row crops
Atrazine	3	3	ppb	<0.1	No	Nov 10	Runoff from herbicide used on row crops
Benzo (a) pyrene (PAH)	200	0	ppt	<20	No	Nov 10	Leaching from linings of water storage tanks and distribution lines
Carbofuran	40	40	ppb	<0.5	No	Nov 10	Leaching of soil fumigant used on rice and alfalfa
Chlordane	2	0	ppb	<0.1	No	Nov 10	Residue of banned termiticide
Dalapon	200	200	ppb	<1	No	Nov 10	Runoff from herbicide used on rights of way
Di (2-ethylhexyl) adipate	400	400	ppb	<0.6	No	Nov 10	Discharge from chemical factories
Di (2-ethylhexyl) phthalate	6	0	ppb	<0.6	No	Nov 10	Discharge from rubber and chemical factories
Dibromochloropropane	200	0	ppt	<20	No	Nov 10	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards
Dinoseb	7	7	ppb	<0.2	No	Nov 10	Runoff from herbicide used on soybeans and vegetables
Diquat	20	20	ppb	<0.4	No	Nov 10	Runoff from herbicide use
Endothall	100	100	ppb	none	No	Nov 10	Runoff from herbicide use
Endrin	2	2	ppb	<1	No	Nov 10	Residue of banned insecticide
Ethylene dibromide	50	0	ppt	<10	No	Nov 10	Discharge from petroleum refineries
Glyphosate	700	700	ppb	<6	No	Nov 10	Runoff from herbicide use
Heptachlor	400	0	ppt	<40	No	Nov 10	Residue of banned temiticide
Heptachlor epoxide	200	0	ppt	<20	No	Nov 10	Breakdown of heptachlor
Hexachlorobenzene	1	0	ppb	<0.1	No	Nov 10	Discharge from metal refineries and agricultural chemical factories
Hexachlorocyclo pentadiene	50	50	ppb	<0.1	No	Nov 10	Discharge from chemical factories
Lindane	200	200	ppt	<20	No	Nov 10	Runoff/leaching from insecticide used on cattle, lumber, gardens
Methoxychlor	40	40	ppb	<0.1	No	Nov 10	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock
Oxamyl [Vydate]	200	200	ppb	<2	No	Nov 10	Runoff/leaching from insecticide used on apples, potatoes and tomatoes
PCBs [Polychlorinated biphenyls]	500	0	ppt	<0.1	No	Nov 10	Runoff from landfills; discharge of waste chemicals
Pentachlorophenol	1	0	ppb	<1	No	Nov 10	Discharge from wood preserving factories
Picloram	500	500	ppb	<1	No	Nov 10	Herbicide runoff
Simazine	4	4	ppb	<0.5	No	Nov 10	Herbicide runoff
Toxaphene	3	0	ppb	<1	No	Nov 10	Runoff/leaching from insecticide used on cotton and cattle

Volatile Organic Contaminants

Contaminant	MCL	MCLG	Units	Level Detected/ Range	Violation (Yes or No)	Sample Date	Likely Source of Contamination
Benzene	5	0	ppb	<0.5	No	Mar 10	Discharge from factories; leaching from gas storage tanks and landfills
Carbon tetrachloride	5	0	ppb	<0.5	No	Mar 10	Discharge from chemical plants and other industrial activities
Chlorobenzene	100	100	ppb	<0.5	No	Mar 10	Discharge from chemical and agricultural chemical factories
o-Dichlorobenzene	600	600	ppb	<0.5	No	Mar 10	Discharge from industrial chemical factories
p-Dichlorobenzene	75	75	ppb	<0.5	No	Mar 10	Discharge from industrial chemical factories
1,2-Dichloroethane	5	0	ppb	<0.5	No	Mar 10	Discharge from industrial chemical factories
1,1-Dichloroethylene	7	7	ppb	<0.5	No	Mar 10	Discharge from industrial chemical factories
cis-1,2-Dichloroethylene	70	70	ppb	<0.5	No	Mar 10	Discharge from industrial chemical factories
trans-1,2-Dichloroethylene	100	100	ppb	<0.5	No	Mar 10	Discharge from industrial chemical factories

Contaminant	MCL	MCLG	Units	Level Detected/ Range	Violation (Yes or No)	Sample Date	Likely Source of Contamination
Dichloromethane	5	0	ppb	<0.5	No	Mar 10	Discharge from pharmaceutical and chemical factories
1,2-Dichloropropane	5	0	ppb	<0.5	No	Mar 10	Discharge from industrial chemical factories
Ethylbenzene	700	700	ppb	<0.5	No	Mar 10	Discharge from petroleum refineries
Styrene	100	100	ppb	<0.5	No	Mar 10	Discharge from rubber and plastic factories; leaching from landfills
Tetrachloroethylene	5	0	ppb	<0.5	No	Mar 10	Discharge from factories and dry cleaners
1,2,4-Trichlorobenzene	70	70	ppb	<0.5	No	Mar 10	Discharge from textile-finishing factories
1,1,1-Trichloroethane	200	200	ppb	<0.5	No	Mar 10	Discharge from metal degreasing sites and other factories
1,1,2-Trichloroethane	5	3	ppb	<0.5	No	Mar 10	Discharge from industrial chemical factories
Trichloroethylene	5	0	ppb	<0.5	No	Mar 10	Discharge from metal degreasing sites and other factories
Toluene	1	1	ppm	<0.5	No	Mar 10	Discharge from petroleum factories
Vinyl Chloride	2	0	ppb	<0.5	No	Mar 10	Leaching from PVC piping; discharge from chemical factories
Xylenes *	10	10	ppm	<0.5	No	Mar 10	Discharge from petroleum factories; discharge from chemical factories

Results shown in the chart above for Xylenes reflects sampling done after the Max Contaminant Level violation. Even after subsequent sampling, shows results well below the minimum levels, the state requires the violation from 1st Qtr 2010 be listed.

Violations

The following violations were received by our water system or were ongoing in the calendar year 2010

Type/Description	***Compliance Period***
Maximum Contaminant Level for Xylene *	1st Quarter

Luke AFB published Public Notices for the above listed violations in the base newspaper, the *Thunderbolt*. For additional information on the cause of these violations and their resolution, please contact Bioenvironmental Engineering at (623) 856 -7521. Other missed monitoring events occurred due to out-of-service wells at Luke AFB.

Health Effects Information About the Above Tables

Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods-of-time because of rainfall or agricultural activity. If you are caring for an infant, and detected nitrate levels are above 5 ppm, you should ask advice from your health care provider.

If **arsenic** is less than the MCL, your drinking water meets EPA's standards. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

Infants and young children are typically more vulnerable to **lead** in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested. Flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the EPA *Safe Drinking Water Hotline* at 1-800-426-4791. For any additional information, or questions concerning this report, feel free to contact Stewart Proctor at Bioenvironmental Engineering; 623-856-7521.